



SEQUENCE LISTING

RECEIVED  
OCT 23 2001  
TECH CENTER 1600/2900

<110> Astra AB, Järfälla, Sweden

<120> Vaccine Delivery System and Method of Production

<130> 1103326-0560

<140> 09/308,435

<141> 1999-05-19

<150> PCT/SE99/00582

<151> 1999-04-09

<150> SE 9801288-3

<151> 1998-04-14

<160> 25

<170> PatentIn Ver. 2.1

<210> 1

<211> 1670

<212> DNA

<213> Helicobacter pylori

<220>

<221> CDS

<222> (793) .. (1572)

<400> 1

gacccatcg cgccaaaggt ggtattagga ataagagctt gattattaat ctccctggta 60  
agtccaaaaa gtattagaga atgcttagag gcggtttttc cagcgattcc ttattgctgt 120  
gatttgattt tagggaatta catgcaagtg aatgaaaaaa acattcaagc gtttgcccc 180  
aaacaataag gtaaaaaatg ccaactcactc atttgaatga agaaaatcaa cctaaaatgg 240  
tggatatagg ggataaagaa accactgaaa gaatcgctct agcaagcggg cgtatcagca 300  
tgaataaaga ggcttatgac gctattatca atcatggcgt caaaaagggt ccggtattac 360  
aaactgctat tattgctggg attatggggg ctaaaaagac aagcgaactc attcccatgt 420  
gccatccaat catgctcaat ggggtggata ttgatatttt agaagaaaaa gagacttgta 480  
gttttaaaact ctatgcgaga gtcaaaactc aagctaaaac gggcgtagaa atggaagcgc 540  
taatgagtgt gagcgtaggg cttttaacca tttatgacat ggtgaaagcc attgataaga 600  
gcatgacaat tagcgggtgtg atgctggaat ataaaagtgg aggcaaaagt ggggattata 660

acgctaaaaa atagaaaaag actgataatc taaagatatt agggtaaaat aacattttga 720

caacaaaagc gtgttggttg cttcggattt gttgttatag aagtctaaaa tattacaatc 780

aaggatagaa cg atg aga gca aat aat cat ttt aaa gat ttt gca tgg aaa 831  
Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys  
1 5 10

aaa tgc ctt tta ggc gcg agc gtg gtg gct tta tta gtg gga tgc agc 879  
Lys Cys Leu Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Cys Ser  
15 20 25

ccg cat att att gaa acc aat gaa gtc gct ttg aaa ttg aat tac cat 927  
Pro His Ile Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His  
30 35 40 45

cca gct agc gag aaa gtt caa gcg tta gat gaa aag att ttg ctt tta 975  
Pro Ala Ser Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu Leu  
50 55 60

agg cca gct ttc caa tat agc gat aat atc gct aaa gag tat gaa aac 1023  
Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu Asn  
65 70 75

aaa ttc aag aat caa acc gcg ctc aag gtt gaa cag att ttg caa aat 1071  
Lys Phe Lys Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln Asn  
80 85 90

caa ggc tat aag gtt att agc gta gat agc agc gat aaa gac gat ttt 1119  
Gln Gly Tyr Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp Phe  
95 100 105

tct ttt gca caa aaa aaa gaa ggg tat ttg gcg gtt gct atg aat ggc 1167  
Ser Phe Ala Gln Lys Lys Glu Gly Tyr Leu Ala Val Ala Met Asn Gly  
110 115 120 125

gaa att gtt tta cgc ccc gat cct aaa agg acc ata cag aaa aaa tca 1215  
Glu Ile Val Leu Arg Pro Asp Pro Lys Arg Thr Ile Gln Lys Lys Ser  
130 135 140

gaa ccc ggg tta tta ttc tcc acc ggt ttg gac aaa atg gaa ggg gtt 1263  
Glu Pro Gly Leu Leu Phe Ser Thr Gly Leu Asp Lys Met Glu Gly Val  
145 150 155

tta atc ccg gct ggg ttt att aag gtt acc ata cta gag cct atg agt 1311  
Leu Ile Pro Ala Gly Phe Ile Lys Val Thr Ile Leu Glu Pro Met Ser  
160 165 170

ggg gaa tct ttg gat tct ttt acg atg gat ttg agc gag ttg gac att 1359  
Gly Glu Ser Leu Asp Ser Phe Thr Met Asp Leu Ser Glu Leu Asp Ile  
175 180 185

caa gaa aaa ttc tta aaa acc acc cat tca agc cat agc ggg ggg tta 1407  
 Gln Glu Lys Phe Leu Lys Thr Thr His Ser Ser His Ser Gly Gly Leu  
 190 195 200 205

gtt agc act atg gtt aag gga acg gat aat tct aat gac gcg atc aag 1455  
 Val Ser Thr Met Val Lys Gly Thr Asp Asn Ser Asn Asp Ala Ile Lys  
 210 215 220

agc gct ttg aat aag att ttt gca aat atc atg caa gaa ata gac aaa 1503  
 Ser Ala Leu Asn Lys Ile Phe Ala Asn Ile Met Gln Glu Ile Asp Lys  
 225 230 235

aaa ctc act caa aag aat tta gaa tct tat caa aaa gac gcc aaa gaa 1551  
 Lys Leu Thr Gln Lys Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu  
 240 245 250

tta aaa ggc aaa aga aac cga taaaaacaaa taacgcataa gaaaagaacg 1602  
 Leu Lys Gly Lys Arg Asn Arg  
 255 260

cttgaataaa ctgcttaaaa aggggtttttt agcggttcttt ttgagcgtgt atttaagggc 1662

tgatgatc 1670

<210> 2

<211> 260

<212> PRT

<213> Helicobacter pylori

<400> 2

Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu  
 1 5 10 15

Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Cys Ser Pro His Ile  
 20 25 30

Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His Pro Ala Ser  
 35 40 45

Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu Leu Arg Pro Ala  
 50 55 60

Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu Asn Lys Phe Lys  
 65 70 75 80

Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln Asn Gln Gly Tyr  
 85 90 95

Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp Phe Ser Phe Ala  
 100 105 110

Gln Lys Lys Glu Gly Tyr Leu Ala Val Ala Met Asn Gly Glu Ile Val  
           115                          120                          125  
 Leu Arg Pro Asp Pro Lys Arg Thr Ile Gln Lys Lys Ser Glu Pro Gly  
           130                          135                          140  
 Leu Leu Phe Ser Thr Gly Leu Asp Lys Met Glu Gly Val Leu Ile Pro  
 145                          150                          155                          160  
 Ala Gly Phe Ile Lys Val Thr Ile Leu Glu Pro Met Ser Gly Glu Ser  
                           165                          170                          175  
 Leu Asp Ser Phe Thr Met Asp Leu Ser Glu Leu Asp Ile Gln Glu Lys  
                           180                          185                          190  
 Phe Leu Lys Thr Thr His Ser Ser His Ser Gly Gly Leu Val Ser Thr  
           195                          200                          205  
 Met Val Lys Gly Thr Asp Asn Ser Asn Asp Ala Ile Lys Ser Ala Leu  
           210                          215                          220  
 Asn Lys Ile Phe Ala Asn Ile Met Gln Glu Ile Asp Lys Lys Leu Thr  
 225                          230                          235                          240  
 Gln Lys Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu Leu Lys Gly  
                           245                          250                          255  
 Lys Arg Asn Arg  
           260

<210> 3  
 <211> 1670  
 <212> DNA  
 <213> Helicobacter pylori

<220>  
 <221> CDS  
 <222> (793)..(1572)

<400> 3  
 gatcctatcg cgccaaaggt ggtattagga ataagagctt gattattaat ctccctggta 60  
 agtccaaaaa gtattagaga atgcttagag gcgggtttttc cagcgattcc ttattgcgtg 120  
 gatttgattt tagggaatta catgcaagtg aatgaaaaaa acattcaagc gtttgccccc 180  
 aaacaataag gtaaaaaatg ccaatcactc atttgaatga agaaaatcaa cctaaaatgg 240  
 tggatatagg ggataaagaa accactgaaa gaatcgctct agcaagcggg cgtatcagca 300

tgaataaaga ggcttatgac gctattatca atcatggcgt caaaaagggc ccggtattac 360  
 aaactgctat tattgctggg attatggggg ctaaaaagac aagcgaactc attcccatgt 420  
 gccatccaat catgctcaat ggggtggata ttgatatttt agaagaaaaa gagacttgta 480  
 gttttaaact ctatgcgaga gtcaaaactc aagctaaaac gggcgtagaa atggaagcgc 540  
 taatgagtgt gagcgtaggg cttttaacca tttatgacat ggtgaaagcc attgataaga 600  
 gcatgacaat tagcgggtgtg atgctggaat ataaaagtgg aggcaaaagt ggggattata 660  
 acgctaaaaa atagaaaaag actgataatc taaagatatt agggtaaaat aacattttga 720  
 caacaaaagc gtgttggttg cttcggattt gttgttatag aagtctaaaa tattacaatc 780  
 aaggatagaa cg atg aga gca aat aat cat ttt aaa gat ttt gca tgg aaa 831  
                   Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys  
                   1                  5                  10  
 aaa tgc ctt tta ggc gcg agc gtg gtg gct tta tta gtg gga tgc agc 879  
 Lys Cys Leu Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Cys Ser  
           15                  20                  25  
 ccg cat att att gaa acc aat gaa gtc gct ttg aaa ttg aat tac cat 927  
 Pro His Ile Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His  
           30                  35                  40                  45  
 cca gct agc gag aaa gtt caa gcg tta gat gaa aag att ttg ctt tta 975  
 Pro Ala Ser Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu Leu  
                   50                  55                  60  
 agg cca gct ttc caa tat agc gat aat atc gct aaa gag tat gaa aac 1023  
 Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu Asn  
                   65                  70                  75  
 aaa ttc aag aat caa acc gcg ctc aag gtt gaa cag att ttg caa aat 1071  
 Lys Phe Lys Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln Asn  
                   80                  85                  90  
 caa ggc tat aag gtt att agc gta gat agc agc gat aaa gac gat ttt 1119  
 Gln Gly Tyr Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp Phe  
           95                  100                  105  
 tct ttt gca caa aaa aaa gaa ggg tat ttg gcg gtt gct atg aat ggc 1167  
 Ser Phe Ala Gln Lys Lys Glu Gly Tyr Leu Ala Val Ala Met Asn Gly  
           110                  115                  120                  125  
 gaa att gtt tta cgc ccc gat cct aaa agg acc ata cag aaa aaa tca 1215  
 Glu Ile Val Leu Arg Pro Asp Pro Lys Arg Thr Ile Gln Lys Lys Ser  
                   130                  135                  140

gaa ccc ggg tta tta ttc tcc acc ggt ttg gac aaa atg gaa ggg gtt 1263  
 Glu Pro Gly Leu Leu Phe Ser Thr Gly Leu Asp Lys Met Glu Gly Val  
 145 150 155  
  
 tta atc ccg gct ggg ttt att aag gtt acc ata cta gag cct atg agt 1311  
 Leu Ile Pro Ala Gly Phe Ile Lys Val Thr Ile Leu Glu Pro Met Ser  
 160 165 170  
  
 ggg gaa tct ttg gat tct ttt acg atg gat ttg agc gag ttg gac att 1359  
 Gly Glu Ser Leu Asp Ser Phe Thr Met Asp Leu Ser Glu Leu Asp Ile  
 175 180 185  
  
 caa gaa aaa ttc tta aaa acc acc cat tca agc cat agc ggg ggg tta 1407  
 Gln Glu Lys Phe Leu Lys Thr Thr His Ser Ser His Ser Gly Gly Leu  
 190 195 200 205  
  
 gtt agc act atg gtt aag gga acg gat aat tct aat gac gcg atc aag 1455  
 Val Ser Thr Met Val Lys Gly Thr Asp Asn Ser Asn Asp Ala Ile Lys  
 210 215 220  
  
 aga gct ttg aat aag att ttt gca aat atc atg caa gaa ata gac aaa 1503  
 Arg Ala Leu Asn Lys Ile Phe Ala Asn Ile Met Gln Glu Ile Asp Lys  
 225 230 235  
  
 aaa ctc act caa aag aat tta gaa tct tat caa aaa gac gcc aaa gaa 1551  
 Lys Leu Thr Gln Lys Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu  
 240 245 250  
  
 tta aaa ggc aaa aga aac cga taaaaacaaa taacgcataa gaaaagaacg 1602  
 Leu Lys Gly Lys Arg Asn Arg  
 255 260  
  
 cttgaataaaa ctgcttaaaaa aggggtttttt agcggttcttt ttgagcgtgt atttaagggc 1662  
  
 tgatgatc 1670

<210> 4  
 <211> 260  
 <212> PRT  
 <213> Helicobacter pylori

<400> 4  
 Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu  
 1 5 10 15  
  
 Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Cys Ser Pro His Ile  
 20 25 30  
  
 Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His Pro Ala Ser  
 35 40 45

Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu Leu Arg Pro Ala  
 50 55 60  
 Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu Asn Lys Phe Lys  
 65 70 75 80  
 Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln Asn Gln Gly Tyr  
 85 90 95  
 Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp Phe Ser Phe Ala  
 100 105 110  
 Gln Lys Lys Glu Gly Tyr Leu Ala Val Ala Met Asn Gly Glu Ile Val  
 115 120 125  
 Leu Arg Pro Asp Pro Lys Arg Thr Ile Gln Lys Lys Ser Glu Pro Gly  
 130 135 140  
 Leu Leu Phe Ser Thr Gly Leu Asp Lys Met Glu Gly Val Leu Ile Pro  
 145 150 155 160  
 Ala Gly Phe Ile Lys Val Thr Ile Leu Glu Pro Met Ser Gly Glu Ser  
 165 170 175  
 Leu Asp Ser Phe Thr Met Asp Leu Ser Glu Leu Asp Ile Gln Glu Lys  
 180 185 190  
 Phe Leu Lys Thr Thr His Ser Ser His Ser Gly Gly Leu Val Ser Thr  
 195 200 205  
 Met Val Lys Gly Thr Asp Asn Ser Asn Asp Ala Ile Lys Arg Ala Leu  
 210 215 220  
 Asn Lys Ile Phe Ala Asn Ile Met Gln Glu Ile Asp Lys Lys Leu Thr  
 225 230 235 240  
 Gln Lys Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu Leu Lys Gly  
 245 250 255  
 Lys Arg Asn Arg  
 260

<210> 5  
 <211> 60  
 <212> PRT  
 <213> Helicobacter pylori

<400> 5  
 Met Lys Thr Asn Gly His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu

1	5	10	15
Leu Gly Thr Ser Val Val Ala Leu Leu Val Gly Cys Ser Pro His Ile			
20	25	30	
Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His Pro Ala Ser			
35	40	45	
Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu			
50	55	60	

<210> 6  
 <211> 60  
 <212> PRT  
 <213> Helicobacter pylori

<400> 6
Met Lys Thr Asn Gly His Phe Lys Asp Phe Ala Trp Lys Lys Cys Phe
1 5 10 15
Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Cys Ser Pro His Ile
20 25 30
Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His Pro Ala Ser
35 40 45
Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu
50 55 60

<210> 7  
 <211> 60  
 <212> PRT  
 <213> Helicobacter pylori

<400> 7
Met Lys Thr Asn Gly His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu
1 5 10 15
Leu Gly Ala Ser Val Gly Ala Leu Leu Val Gly Cys Ser Pro His Ile
20 25 30
Ile Glu Thr Asn Glu Val Ala Leu Lys Leu Asn Tyr His Pro Ala Ser
35 40 45
Glu Lys Val Gln Ala Leu Asp Glu Lys Ile Leu Leu
50 55 60

<210> 8  
 <211> 60



<212> PRT  
<213> Helicobacter pylori

<400> 8

Met	Arg	Ala	Asn	Asn	His	Phe	Lys	Asp	Phe	Ala	Trp	Lys	Lys	Cys	Leu
1				5					10					15	
Leu	Gly	Ala	Ser	Val	Val	Ala	Leu	Leu	Val	Gly	Cys	Ser	Pro	His	Ile
			20					25					30		
Ile	Glu	Thr	Asn	Glu	Val	Ala	Leu	Lys	Leu	Asn	Tyr	His	Pro	Ala	Ser
			35					40				45			
Glu	Lys	Val	Gln	Ala	Leu	Asp	Glu	Lys	Ile	Leu	Leu				
	50					55					60				

<210> 9

<211> 60

<212> PRT

<213> Helicobacter pylori

<400> 9

Met	Lys	Ala	Asn	Asn	His	Phe	Lys	Asp	Phe	Ala	Trp	Lys	Lys	Cys	Leu
1				5					10					15	
Leu	Gly	Ala	Ser	Val	Val	Ala	Leu	Leu	Val	Gly	Cys	Ser	Pro	His	Ile
			20					25					30		
Ile	Glu	Thr	Asn	Glu	Val	Ala	Leu	Lys	Leu	Asn	Tyr	His	Pro	Ala	Ser
			35					40				45			
Glu	Lys	Val	Gln	Ala	Leu	Asp	Glu	Lys	Ile	Leu	Leu				
	50					55					60				

<210> 10

<211> 60

<212> PRT

<213> Helicobacter pylori

<400> 10

Leu	Lys	Pro	Ala	Phe	Gln	Tyr	Ser	Asp	Asn	Ile	Ala	Lys	Glu	Tyr	Glu
1				5					10					15	
Asn	Lys	Phe	Lys	Asn	Gln	Thr	Thr	Leu	Lys	Val	Glu	Glu	Ile	Leu	Gln
			20					25					30		
Asn	Gln	Gly	Tyr	Lys	Val	Ile	Asn	Val	Asp	Ser	Ser	Asp	Lys	Asp	Asp
			35				40					45			
Phe	Ser	Phe	Ala	Gln	Lys	Lys	Glu	Gly	Tyr	Leu	Ala				

50

55

60

&lt;210&gt; 11

&lt;211&gt; 60

&lt;212&gt; PRT

&lt;213&gt; Helicobacter pylori

&lt;400&gt; 11

Leu Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu  
 1 5 10 15

Asn Lys Phe Lys Asn Gln Thr Thr Leu Lys Val Glu Glu Ile Leu Gln  
 20 25 30

Asn Gln Gly Tyr Lys Val Ile Asn Val Asp Ser Ser Asp Lys Asp Asp  
 35 40 45

Phe Ser Phe Ala Gln Lys Lys Glu Gly Tyr Leu Ala  
 50 55 60

&lt;210&gt; 12

&lt;211&gt; 60

&lt;212&gt; PRT

&lt;213&gt; Helicobacter pylori

&lt;400&gt; 12

Leu Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu  
 1 5 10 15

Asn Lys Phe Lys Asn Gln Thr Val Leu Lys Val Glu Gln Ile Leu Gln  
 20 25 30

Asn Gln Gly Tyr Lys Val Ile Asn Val Asp Ser Ser Asp Lys Asp Asp  
 35 40 45

Phe Ser Phe Ala Gln Lys Lys Glu Gly Tyr Leu Ala  
 50 55 60

&lt;210&gt; 13

&lt;211&gt; 60

&lt;212&gt; PRT

&lt;213&gt; Helicobacter pylori

&lt;400&gt; 13

Leu Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu  
 1 5 10 15

Asn Lys Phe Lys Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln  
 20 25 30

Asn Gln Gly Tyr Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp  
35 40 45

Phe Ser Phe Ala Gln Lys Lys Glu Gly Tyr Leu Ala  
50 55 60

<210> 14

<211> 60

<212> PRT

<213> Helicobacter pylori

<400> 14

Leu Arg Pro Ala Phe Gln Tyr Ser Asp Asn Ile Ala Lys Glu Tyr Glu  
1 5 10 15

Asn Lys Phe Lys Asn Gln Thr Ala Leu Lys Val Glu Gln Ile Leu Gln  
20 25 30

Asn Gln Gly Tyr Lys Val Ile Ser Val Asp Ser Ser Asp Lys Asp Asp  
35 40 45

Leu Ser Phe Ser Gln Lys Lys Glu Gly Tyr Leu Ala  
50 55 60

<210> 15

<211> 60

<212> PRT

<213> Helicobacter pylori

<400> 15

Val Ala Met Ile Gly Glu Ile Val Leu Arg Pro Asp Pro Lys Arg Thr  
1 5 10 15

Ile Gln Lys Lys Ser Glu Pro Gly Leu Leu Phe Ser Thr Gly Leu Asp  
20 25 30

Lys Met Glu Gly Val Leu Ile Pro Ala Gly Phe Val Lys Val Thr Ile  
35 40 45

Leu Glu Pro Met Ser Gly Glu Ser Leu Asp Ser Phe  
50 55 60

<210> 16

<211> 60

<212> PRT

<213> Helicobacter pylori

<400> 16

Val	Ala	Met	Asn	Gly	Glu	Ile	Val	Leu	Arg	Pro	Asp	Pro	Lys	Arg	Thr
1				5					10					15	
Ile	Gln	Lys	Lys	Ser	Glu	Pro	Gly	Leu	Leu	Phe	Ser	Thr	Gly	Leu	Asp
			20					25					30		
Lys	Met	Glu	Gly	Val	Leu	Ile	Pro	Ala	Gly	Phe	Val	Lys	Val	Thr	Ile
		35					40					45			
Leu	Glu	Pro	Met	Ser	Gly	Glu	Ser	Leu	Asp	Ser	Phe				
	50					55					60				

<210> 17  
 <211> 60  
 <212> PRT  
 <213> Helicobacter pylori

Val	Ala	Met	Asn	Gly	Glu	Ile	Val	Leu	Arg	Pro	Asp	Pro	Lys	Arg	Thr
1				5					10					15	
Ile	Gln	Lys	Lys	Ser	Glu	Pro	Gly	Leu	Leu	Phe	Ser	Thr	Gly	Leu	Asp
			20					25					30		
Lys	Met	Glu	Gly	Val	Leu	Ile	Pro	Ala	Gly	Phe	Ile	Lys	Val	Thr	Ile
		35					40					45			
Leu	Glu	Pro	Met	Ser	Gly	Glu	Ser	Leu	Asp	Ser	Phe				
	50					55					60				

<210> 18  
 <211> 60  
 <212> PRT  
 <213> Helicobacter pylori

Thr	Met	Asp	Leu	Ser	Glu	Leu	Asp	Ile	Gln	Glu	Lys	Phe	Leu	Lys	Thr
1				5					10					15	
Thr	His	Ser	Ser	His	Ser	Gly	Gly	Leu	Val	Ser	Thr	Met	Val	Lys	Gly
			20					25					30		
Thr	Asp	Asn	Ser	Asn	Asp	Ala	Ile	Lys	Ser	Ala	Leu	Asn	Lys	Ile	Phe
		35					40					45			
Ala	Ser	Ile	Met	Gln	Glu	Met	Asp	Lys	Lys	Leu	Thr				
	50					55					60				

<210> 19

<211> 60  
<212> PRT  
<213> Helicobacter pylori

<400> 19  
Thr Met Asp Leu Ser Glu Leu Asp Ile Gln Glu Lys Phe Leu Lys Thr  
1 5 10 15  
Thr His Ser Ser His Ser Gly Gly Leu Val Ser Thr Met Val Lys Gly  
20 25 30  
Thr Asp Asn Ser Asn Asp Ala Ile Lys Ser Ala Leu Asn Lys Ile Phe  
35 40 45  
Gly Ser Ile Met Gln Glu Ile Asp Lys Lys Leu Thr  
50 55 60

<210> 20  
<211> 60  
<212> PRT  
<213> Helicobacter pylori

<400> 20  
Thr Met Asp Leu Ser Glu Leu Asp Ile Gln Glu Lys Phe Leu Lys Thr  
1 5 10 15  
Thr His Ser Ser His Ser Gly Gly Leu Val Ser Thr Met Val Lys Gly  
20 25 30  
Thr Asp Asn Ser Asn Asp Ala Ile Lys Ser Ala Leu Asn Lys Ile Phe  
35 40 45  
Ala Asn Ile Met Gln Glu Ile Asp Lys Lys Leu Thr  
50 55 60

<210> 21  
<211> 20  
<212> PRT  
<213> Helicobacter pylori

<400> 21  
Gln Arg Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu Leu Lys Asn  
1 5 10 15  
Lys Arg Asn Arg  
20

<210> 22

<211> 20  
<212> PRT  
<213> Helicobacter pylori

<400> 22  
Gln Lys Asn Leu Glu Ser Tyr Gln Lys Asp Ala Lys Glu Leu Lys Gly  
1 5 10 15  
Lys Arg Asn Arg  
20

<210> 23  
<211> 31  
<212> PRT  
<213> Helicobacter pylori

<400> 23  
Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu  
1 5 10 15  
Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Leu Ala Gly Cys  
20 25 30

<210> 24  
<211> 31  
<212> PRT  
<213> Helicobacter pylori

<220>  
<221> MOD\_RES  
<222> (31)  
<223> n-propyl alcohol attached to sulfhydryl group of  
cysteine residue at position 31

<400> 24  
Met Arg Ala Asn Asn His Phe Lys Asp Phe Ala Trp Lys Lys Cys Leu  
1 5 10 15  
Leu Gly Ala Ser Val Val Ala Leu Leu Val Gly Leu Ala Gly Cys  
20 25 30

<210> 25  
<211> 31  
<212> PRT  
<213> Helicobacter pylori

<220>  
<221> MOD\_RES  
<222> (31)

<223> lipid chains a and b attached respectively at  
positions 3 and 2 of propyl group attached to  
sulfhydryl of cysteine residue at position 31

<400> 25

Met	Arg	Ala	Asn	Asn	His	Phe	Lys	Asp	Phe	Ala	Trp	Lys	Lys	Cys	Leu
1				5					10					15	

Leu	Gly	Ala	Ser	Val	Val	Ala	Leu	Leu	Val	Gly	Leu	Ala	Gly	Cys	
			20					25					30		

---